What is claimed is:

1. A method for performing data analysis on data gathered in an electronic device manufacturing process comprising:

collecting production data;

collecting non-production data;

performing calculations on the production data;

performing calculations on the non-production data;

keying the production data;

keying the non-production data;

combining the production data and the non-production data into a single data set; and

analyzing said single data-set.

2. The method of claim 1, wherein collecting production data includes collecting production data from a test probe.

3. The method of claim 1, wherein collecting production data includes collecting parametric production data.

4. The method of claim 1, wherein collecting production data includes collecting data on film thickness.

5. The method of claim 1, wherein collecting production data includes collecting data on critical dimensions.

6. The method of claim 1, wherein collecting production data includes any other data that is relevant to the production process and its condition.

7. The method of claim 1, wherein collecting non-production data includes collecting non-production data from a single data source at a single source location.

8. The method of claim 1, wherein collecting non-production data includes collecting non-production data from a single data source from a plurality of locations.

9. A method for performing data analysis on data gathered in an electronic device manufacturing process, comprising:

collecting production data;

collecting non-production data from a single data source from at least one of a plurality of locations with some temporal periodicity;

performing calculations on the production data;

performing calculations on the non-production data;

keying the production data;

keying the non-production data;

combining the production data and the non-production data into a single data set; and

analyzing the single data set.

10. The method of claim 9, wherein the temporal periodicity is fixed.

11. The method of claim 9, wherein the temporal periodicity is not fixed.

12. The method of claim 9, wherein collecting non-production data includes collecting atmospheric data.

13. The method of claim 9, wherein collecting non-production data includes collecting facility related quality data.

14. The method of claim 9, wherein collecting non-production data includes collecting equipment control data.

15. The method of claim 9, wherein collecting non-production data includes collecting metrology tool calibration data.

16. The method of claim 9, wherein collecting non-production data includes collecting any other data relevant to the production environment.

17. A method for performing data analysis on data gathered in an electronic device manufacturing process, comprising:

collecting production data;

collecting non-production data;

performing calculations on the production data;

performing weighted mean calculations on the non-production data;

keying the production data;

keying the non-production data;

combining the production data and the non-production data into a single data set; and

analyzing the single data set.

18. The method of claim 17 wherein the weighted mean calculation is weighted first by location where the data sources are from a plurality of locations, given by the following equation:

$$V = \sum_{n=1}^{i} \left[\frac{d_i}{\sum_{n=1}^{i} d_i} \right] S_i$$

where, V is the calculated data point, d_i is the distance between the sampling point and the process location and S_i is the data being measured at the sampling point.

19. The method of claim 18, wherein the data is further calculated by performing a weighted mean calculation by time, given by the equation:

$$V = \left(\frac{1}{tS_{x-1} - tS_x}\right)\left[S_x\left(tS_{x+1} - tL_v\right) + S_{x+1}\left(tL_v - tS_x\right)\right]$$

where V is the calculated lot data to be keyed to the production lot data, tS_x is the time of the most recent facility data sampling, tS_{X+1} is the time of the next consecutive facility data sampling, and tL_v is the time of processing the production lot.

20. The method of claim 17 wherein the weighted mean calculation is weighted by time, given by the equation:

$$V = \left(\frac{1}{tS_{x-1} - tS_x}\right)\left[S_x\left(tS_{x+1} - tL_v\right) + S_{x+1}\left(tL_v - tS_x\right)\right]$$

where V is the calculated lot data to be keyed to the production lot data, tS_x is the time of the most recent facility data sampling, tS_{X+1} is the time of the next consecutive facility data sampling, and tL_v is the time of processing the production lot.

21. The method of claim 17, wherein keying the production data includes adding the calculated non-production data to the appropriate production data.

22. The method of claim 21, wherein the appropriate production data is data from production lots that were processed during the collection of relevant non-production data.

23. A method for performing data analysis on data gathered in an electronic device manufacturing process, comprising:

collecting production data;

collecting non-production data data;

performing calculations on the production data;

performing weighted mean calculations on the non-production data;

keying the production data;

keying the non-production data;

identifying points of data commonality between the production and non-production data set;

defining relationships based on the identified commonalities;

combining the production data and the non-production data based on the defined relationships into a single data-set; and

analyzing the single data-set.

24. The method of claim 23, wherein analyzing said single data set includes performing a trend analysis.

25. The method of claim 23, wherein analyzing said single data set includes statistical analysis.

26. A method for detecting trends in electronic device manufacturing, comprising:

collecting production data;

collecting non-production data data;

performing calculations on the production data;

performing calculations on the non-production data;

keying production data;

keying non-production data;

combining the production data and the non-production data into a single data set;

analyzing said data set; and

examining the analysis of the data.

27. The method of claim 26, wherein collecting production data includes collecting production data from a test probe.

28. The method of claim 26, wherein collecting production data includes collecting parametric production data.

29. The method of claim 26, wherein collecting production data includes collecting data on film thickness.

30. The method of claim 26, wherein collecting production data includes collecting data on critical dimensions.

31. The method of claim 26, wherein collecting production data includes any other data that is relevant to the production process and its condition.

32. The method of claim 26, wherein collecting non-production data includes collecting non-production data from a single data source at a single source location.

33. The method of claim 26, wherein collecting non-production data includes collecting non-production data from a single data source from a plurality of locations.

34. A method for detecting trends in electronic device manufacturing, comprising:

collecting production data;

collecting non-production data from a single data source with some temporal periodicity;

performing calculations on the production data;

performing calculations on the non-production data;

keying the production data;

keying the non-production data;

combining the production data and the non-production data into a single data set;

analyzing the single data set; and

examining the analysis of the data.

35. The method of claim 34, wherein the temporal periodicity is fixed.

36. The method of claim 34, wherein the temporal periodicity is not fixed.

37. The method of claim 34, wherein collecting non-production data includes collecting atmospheric data.

38. The method of claim 34, wherein collecting non-production data includes collecting facility related quality data.

39. The method of claim 34, wherein collecting non-production data includes collecting equipment control data.

40. The method of claim 34, wherein collecting non-production data includes collecting metrology tool calibration data.

41. The method of claim 34, wherein collecting non-production data includes collecting any other data relevant to the production environment.

42. A method for detecting trends in electronic device manufacturing, comprising:

collecting production data;

collecting non-production data;

performing calculations on the production data;

performing weighted mean calculations on the non-production data;

keying the production data;

keying the non-production data;

combining the production data and the non-production data into a single data set;

analyzing the single data set; and

examining the analysis of the data.

43. The method of claim 42, wherein the weighted mean calculation is weighted first by location where the data sources are from a plurality of locations, given by the following equation:

$$V = \sum_{n=1}^{i} \left[\frac{d_i}{\sum_{n=1}^{i} d_i} \right] S_i$$

where, V is the calculated data point, d_i is the distance between the sampling point and the process location and S_i is the data being measured at the sampling point.

44. The method of claim 43, wherein the data is further calculated by performing a weighted mean calculation by time, given by the equation:

$$V = \left(\frac{1}{tS_{x-1} - tS_x} \right) \left[S_x \left(tS_{x+1} - tL_v \right) + S_{x+1} \left(tL_v - tS_x \right) \right]$$

where V is the calculated lot data to be keyed to the production lot data, tS_x is the time of the most recent facility data sampling, tS_{X+1} is the time of the next consecutive facility data sampling, and tL_v is the time of processing the production lot.

45. The method of claim 42, wherein the weighted mean calculation is weighted by time, given by the equation:

$$V = \left(\frac{1}{tS_{x-1} - tS_x} \right) \left[S_x \left(tS_{x+1} - tL_v \right) + S_{x+1} \left(tL_v - tS_x \right) \right]$$

where V is the calculated lot data to be keyed to the production lot data, tS_x is the time of the most recent facility data sampling, tS_{X+1} is the time of the next consecutive facility data sampling, and tL_v is the time of processing the production lot.

46. The method of claim 42, wherein keying the production data includes adding the calculated non-production data to the appropriate production data.

47. The method of claim 46 wherein the appropriate production data is data from production lots that were processed during the collection of relevant non-production data.

48. A method for detecting trends in electronic device manufacturing, comprising:

collecting production data;

collecting non-production data;

performing calculations on the production data;

performing weighted mean calculations on the non-production data;

keying the production data;

keying the non-production data;

identifying points of data commonality between the production and non-production data set;

defining relationships based on the identified commonalities;

combining the production data and the non-production data based on the defined relationships into a single data-set;

analyzing the single data-set; and

examining the analysis of the data.

49. The method of claim 48, wherein analyzing said single data set includes performing a trend analysis.

50. The method of claim 48, wherein analyzing said single data set includes statistical analysis.

51. The method of claim 48, wherein the analyzing includes analyzing the data on a data processing device.

52. The method of claim 48, wherein the analyzing includes analyzing the data on an output device.

53. The method of claim 48, wherein the analyzing includes analyzing the data remotely over a communications network.

54. The method of claim 48, wherein the analyzing includes analyzing the data remotely over a Wide Area Network.

55. A method for detecting trends in electronic device manufacturing, comprising:

collecting production data;

collecting non-production data;

performing calculations on the production data;

performing weighted mean calculations on the non-production data;

keying the production data;

keying the non-production data;

identifying points of data commonality between the production and non-production data set;

defining relationships based on the identified commonalities;

combining the production data and the non-production data based on the defined relationships into a single data-set;

analyzing the single data-set; and

examining the analysis of the data for conditions of the manufacturing process

56. The method of claim 55, wherein examining analysis of the data includes comparing the analysis of the collected data to some baseline analysis and identifying areas where trends are out of specifications.

57. The method of claim 55, wherein examining analysis of the data includes comparing the analysis of the collected data to some baseline analysis and identifying areas where readings are out of specifications.

58. The method of claim 55, wherein examining analysis of the data includes comparing the analysis of the collected data to some baseline analysis and identifying areas where trends and readings are out of specifications.

59. The method of claim 55, wherein the examining analysis includes storing the analyzed data on a server, accessing the data remotely over a communications network from a server and viewing the data on a client interface.

60. The method of claim 59, wherein the examining analysis includes storing the analyzed data on a server, accessing the data remotely over a Wide Area Network from a server and viewing the data on a client interface.

61. A computer system, comprising:

a processor;

at least one input device;

at least one output device;

at least one communications interface device;

a storage device containing instructions for performing a method, the method comprising:

collecting production data;

collecting non-production data;

performing calculations on the production data;

performing calculations on the non-production data;

keying production data;

keying non-production data;

combining the production data and the non-production data into a single data set;

analyzing said data set; and

examining the analysis of the data; and

a bus connecting the processor, input device, output device and storage device.

62. The computer system of claim 61, wherein collecting production data includes collecting production data from a test probe.

63. The computer system of claim 61, wherein collecting production data includes collecting parametric production data.

64. The computer system of claim 51, wherein collecting production data includes collecting data on film thickness.

65. The computer system of claim 61, wherein collecting production data includes collecting data on critical dimensions.

66. The computer system of claim 61, wherein collecting production data includes any other data that is relevant to the production process and its condition.

67. The computer system of claim 61, wherein collecting non-production data includes collecting non-production data from a single data source at a single source location.

68. The computer system of claim 61, wherein collecting non-production data includes collecting non-production data from a single data source from a plurality of locations.

69. A computer system, comprising:

a processor;

at least one input device;

at least one output device;

at least one communications interface device;

a storage device containing instructions for performing a method, the method comprising:

collecting production data;

collecting non-production data from a single data source with some temporal periodicity;

performing calculations on the production data;

performing calculations on the non-production data;

keying the production data;

keying the non-production data;

combining the production data and the non-production data into a single data set;

analyzing the single data set; and

examining the analysis of the data; and

a bus connecting the processor, input device, output device, communications interface device and storage device.

70. The computer system of claim 69, wherein the temporal periodicity is fixed.

71. The computer system of claim 69, wherein the temporal periodicity is not fixed.

72. The computer system of claim 69, wherein collecting non-production data includes collecting atmospheric data.

73. The computer system of claim 69, wherein collecting non-production data includes collecting facility related quality data.

74. The computer system of claim 69, wherein collecting non-production data includes collecting equipment control data.

75. The computer system of claim 69, wherein collecting non-production data includes collecting metrology tool calibration data.

76. The computer system of claim 69, wherein collecting non-production data includes collecting any other data relevant to the production environment.

77. A computer system, comprising:

a processor;

at least one input device;

at least one output device;

at least one communications interface device;

a storage device containing instructions for performing a method, the method comprising:

collecting production data;

collecting non-production data;

performing calculations on the production data;

performing weighted mean calculations on the non-production data;

keying the production data;

keying the non-production data;

combining the production data and the non-production data into a single data set;

analyzing the single data set; and

examining the analysis of the data; and

a bus connecting the processor, input device, output device, communications interface device and storage device.

78. The computer system of claim 77, wherein the weighted mean calculation is weighted first by location where the data sources are from a plurality of locations, given by the following equation:

$$V = \sum_{n=1}^{i} \left[\frac{d_i}{\sum_{n=1}^{i} d_i} \right] S_i$$

where, V is the calculated data point, d_i is the distance between the sampling point and the process location and S_i is the data being measured at the sampling point.

79. The computer system of claim 78, wherein the data is further calculated by performing a weighted mean calculation by time, given by the equation:

$$V = \left(\frac{1}{tS_{x-1} - tS_x} \right) \left[S_x (tS_{x+1} - tL_v) + S_{x+1} (tL_v - tS_x) \right]$$

where V is the calculated lot data to be keyed to the production lot data, tS_x is the time of the most recent facility data sampling, tS_{X+1} is the time of the next consecutive facility data sampling, and tL_v is the time of processing the production lot.

80. The computer system of claim 77, wherein the weighted mean calculation is weighted by time, given by the equation:

$$V = \left(\frac{1}{tS_{x-1} - tS_x} \right) \left[S_x (tS_{x+1} - tL_v) + S_{x+1} (tL_v - tS_x) \right]$$

where V is the calculated lot data to be keyed to the production lot data, tS_x is the time of the most recent facility data sampling, tS_{X+1} is the time of the next consecutive facility data sampling, and tL_v is the time of processing the production lot.

81. The computer system of claim 77, wherein keying the production data includes adding the calculated non-production data to the appropriate production data.

82. The computer system of claim 81, wherein the appropriate production data is data from production lots that were processed during the collection of relevant non-production data.

83. A computer system, comprising:

a processor;

at least one input device;

at least one output device;

at least one communications interface device;

a storage device containing instructions for performing a method, the method comprising:

collecting production data;

collecting non-production data;

performing calculations on the production data;

performing weighted mean calculations on the non-production data;

keying the production data;

keying the non-production data;

identifying points of data commonality between the production and non-production data set;

defining relationships based on the identified commonalities;

combining the production data and the non-production data based on the defined relationships into a single data-set;

analyzing the single data-set; and

examining the analysis of the data; and

a bus connecting the processor, input device, output device, communications interface device and storage device.

84. The computer system of claim 83, wherein analyzing said single data set includes performing a trend analysis.

85. The computer system of claim 83, wherein analyzing said single data set includes statistical analysis.

86. The computer system of claim 83, wherein examining analysis of the data includes comparing the analysis of the collected data to some baseline analysis and identifying areas where trends are out of specifications.

87. The computer system of claim 83, wherein examining analysis of the data includes comparing the analysis of the collected data to some baseline analysis and identifying areas where readings are out of specifications.

88. The computer system of claim 83, wherein examining analysis of the data includes comparing the analysis of the collected data to some baseline analysis and identifying areas where trends and readings are out of specifications.

89. A computer system, comprising:

a processor;

at least one input device;

at least one output device;

at least one communications interface device;

a storage device containing instructions for performing a method, the method comprising:

collecting production data;

collecting non-production data;

performing calculations on the production data;

performing weighted mean calculations on the non-production data;

keying the production data;

keying the non-production data;

identifying points of data commonality between the production and non-production data set;

defining relationships based on the identified commonalities;

combining the production data and the non-production data based on the defined relationships into a single data-set;

analyzing a single data-set stored remotely on a server; and

examining the analysis of the data; and

a bus connecting the processor, input device, output device, communications interface device and storage device.

90. The computer system of claim 89, wherein analyzing said single data set includes performing a trend analysis.

91. The computer system of claim 89, wherein analyzing said single data set includes statistical analysis.

92. The computer system of claim 89, wherein examining analysis of the data includes comparing the analysis of the collected data to some baseline analysis and identifying areas where trends are out of specifications.

93. The computer system of claim 89, wherein examining analysis of the data includes comparing the analysis of the collected data to some baseline analysis and identifying areas where readings are out of specifications.

94. The computer system of claim 89, wherein examining analysis of the data includes comparing the analysis of the collected data to some baseline analysis and identifying areas where trends and readings are out of specifications.

95. A computer system, comprising:

a processor;

at least one input device;

at least one output device;

at least one communications interface device;

a storage device containing instructions for performing a method, the method comprising:

collecting production data;

collecting non-production data;

performing calculations on the production data;

performing calculations on the non-production data;

keying production data;

keying non-production data;

combining the production data and the non-production data into a single data set;

analyzing said data set;

examining the analysis of the data; and

responding to the examination of the analysis; and

a bus connecting the processor, input device, output device, communications interface device and storage device.

96. The computer system of claim 95, wherein the responding includes an alert message displayed on the output device when the examination detects a trend in the data that is outside of expected results.

97. The computer system of claim 95, wherein the responding includes an alert message displayed on the output device when the examination detects a data reading that is outside of expected results.

98. The computer system of claim 95, wherein the responding includes an alert message displayed on the output device when the examination detects a trend in the data and a reading in the data that is outside of expected results.

99. The computer system of claim 95, wherein the responding includes non-manually halting the manufacturing process when the examination detects a trend in the data that is outside of expected results.

100. The computer system of claim 95, wherein the responding includes non-manually halting the manufacturing process when the examination detects a reading in the data that is outside of expected results.

101. The computer system of claim 95, wherein the responding includes non-manually halting the manufacturing process when the examination detects a trend in the data and a reading in the data that is outside of expected results.

102. A method of responding to out of specification conditions in electronic device manufacturing, comprising:

collecting production data from at least one of a plurality of data sources;

collecting non-production data from the of plurality of data sources separated by some non-fixed distance from a manufacturing process;

performing calculations on the production data;

performing weighted mean calculations on the non-production data, weighted by time, distance or distance/time;

keying production data by adding the of a plurality of calculated production data to the production data from the production lots that were processed during the collection of the non-production data;

combining the production data and the non-production data into a single data set;

analyzing said data set; and

examining the analysis of the data.

combining the production data and the non-production data based on the defined relationships into a single data-set;

analyzing the single data-set by trend or statistical analysis;

examining the analysis of the data for the occurrence of readings or trends that are out of specifications; and

responding to the examination of the analysis.

103. The method of claim 102, wherein responding to the examination of the analysis includes stopping the manufacturing process where the examination detects out of specification readings or trends.

104. The method of claim 102, wherein responding to the examination of the analysis includes continuing production where the examination detects no out of specification readings or trends.

105. The method of claim 102, wherein the analyzing the single data-set includes analyzing a single data set remotely stored on a server